

Name: \_\_\_\_\_

### at1117paper: Complete the Square (v324)

#### Example

A square's edge length is  $x$  feet. A rectangle has a height of  $x$  feet and a width of 56 feet. Their combined area, found by adding the square's area and the rectangle's area, is 585 square feet. What is the value of  $x$ ?

#### Example's Solution

$$x^2 + 56x = 585$$

To complete the square, add  $(\frac{56}{2})^2 = 784$  to both sides.

$$x^2 + 56x + 784 = 1369$$

Recognize the left side is now a perfect-square trinomial. Factor the left side.

$$(x + 28)^2 = 1369$$

Undo the squaring.

$$x + 28 = \pm\sqrt{1369}$$

$$x + 28 = \pm 37$$

Subtract 28 from both sides.

$$x = -28 \pm 37$$

In this geometric example, we are only concerned about the positive solution. So,

$$x = 9$$

#### Question 1

A square's edge length is  $x$  feet. A rectangle has a height of  $x$  feet and a width of 52 feet. The total area, of the square and rectangle, is 1440 square feet. What is the value of  $x$ ?

**Question 2**

A square's edge length is  $x$  feet. A rectangle has a height of  $x$  feet and a width of 46 feet. The total area, of the square and rectangle, is 495 square feet. What is the value of  $x$ ?

**Question 3**

A square's edge length is  $x$  feet. A rectangle has a height of  $x$  feet and a width of 24 feet. The total area, of the square and rectangle, is 180 square feet. What is the value of  $x$ ?